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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/869,134	11/30/2001	Antonio Braiato	225/50111	1325

7590 08/26/2003

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EXAMINER

WILLIAMS, THOMAS J

ART UNIT	PAPER NUMBER
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3683

DATE MAILED: 08/26/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/869,134

Applicant(s)

BRAIATO ET AL.

Examiner

Thomas J. Williams

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 03 June 2003.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 17-37 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 17 and 19-37 is/are rejected.
- 7) ☒ Claim(s) 18 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☒ The proposed drawing correction filed on 03 June 2003 is: a) ☒ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

1. Acknowledgment is made in the receipt of amendment B filed June 3, 2003.

Drawings

2. The drawings were received on June 3, 2003. These drawings are approved.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

5. Claims 17, 19-22, 24, 26, and 29-37 are rejected under 35 U.S.C. 103(a) as being unpatentable over US 3,348,636 to Boyles in view of US 5,705,008 to Hecht.

Re-claims 17 and 24, Boyles teaches a brake unit, comprising: at least two brake shoes 46 and 46', each brake shoe has a friction lining 47 and 47'; each brake shoe has two pistons 44 and 45; a brake disc 21 is provided with outer friction surfaces for engagement with the respective friction linings, as is known in the art; at least two application devices (each one defined as

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element 38) act upon the two brake shoes during a brake operation, wherein each friction lining is associated with an individual application device, as best understood by the examiner an application device 30 acts upon two brake shoes 20a and 20b on opposing sides of the disc rotor, therefore each application device 38 can be said to act on two individual brake shoes on opposing sides of the brake disc rotor 21; the friction linings cover more than 15% of the friction surface of the brake disc, as is clearly illustrated; the two application devices 38 and at least two pistons (cl. 24) per brake shoe, as shown in figure 1, will act in a uniform manner on each arcuate brake shoe 46 or 46' and hence on the friction surface of the brake disc. Each application device 38 is provided with a piston. However, Boyles fails to specify the materials used when constructing the brake disc, specifically a metal/ceramic composite.

Hecht teaches that it is known in the brake arts to construct a brake disc from a metal/ceramic composite, see column 1 lines 9-50. Furthermore, this position is supported by the applicant as stated in the instant application, see page 1 lines 13-29. It would have been obvious to one of ordinary skill in the art to have manufactured the brake disc rotor of Boyles from a metal/ceramic composite material as taught by Hecht, thus increasing the lifespan and operational parameters of the brake disc rotor as taught by Hecht, see column 1 lines 43-50.

Re-claim 19, two brake shoes are disposed on each opposing side the brake disc rotor 21, each brake shoe is provided with two application devices 38 (figure 1). Therefore, the four brake shoes acting upon the brake disc rotor are provided with a plurality of application devices.

Re-claim 20, each application device is a single piston caliper when viewed from one side, or a multiple piston caliper when viewed as a whole, i.e. when viewed as straddling the rotor.

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Re-claim 21, two brake shoes are provided for each application device, when each application device is defined as a caliper straddling the rotor.

Re-claim 22, the brake device of Boyles has four individual brake shoes operated by one application device, wherein one application device is defined as a pair of cylinder blocks 38 straddling the rotor. For instance the blocks at the 2 o'clock and 10 o'clock positions act upon four individual brake shoes, two brake shoes per opposing side of the disc rotor. The claim is interpreted as best understood by the examiner in view of the instant application. The instant application provides no illustration or discussion as to what the claim is intended to cover.

Re-claim 26, viewing figure 1, the angle between application devices positioned at the two o'clock position and the ten o'clock position fall within 110 and 130 degrees, thus the lines of action fall between 110 and 130 degrees.

Re-claims 29-37, the brake device of Boyles as modified by Hecht teaches a metal/ceramic composite brake disc rotor comprising: (cl.29) an aluminum/ceramic composite, column 12 lines 4-18; (cl. 30) fiber reinforced composite, column 12 lines 4-18; (cl. 31) the use of carbon or silicone carbide fibers as reinforcement, column 12 lines 4-18; (cl. 32-33) the use of long fibers in either a woven or non-woven structure, column 6 lines 23-34; (cl. 34) the use of short fibers, column 6 lines 23-34; (cl. 35) wherein the short fibers are isotropically oriented, see column 8 lines 34-37; (cl. 38) the metal/ceramic composite material contains either silicon carbide or aluminum oxide ceramic, see column 12 lines 4-18; (cl. 37) the rotor and friction surface are formed as one piece. It would have been obvious to one of ordinary skill in the art to have utilized all of the teachings of Hecht with regards to the brake disc rotor structure when

having provided the brake device of Boyles with a metal/ceramic composite rotor as taught by Hecht, thus improving overall performance and wear of the brake device.

Re-claims 25, 27 and 28, the examiner takes official notice that having an operating friction of coefficient between 0.40 and 0.45, and a compressibility of an intermediate or friction layer of over 1 $\mu\text{m}/\text{bar}$ brake fluid pressure are considered design or engineering choices based upon specific brake requirements. It would have been obvious to one of ordinary skill in the art to have provided the brake device of Boyles as modified by Hecht with various operating parameters based upon intended use, thus providing a brake device with optimum operation.

The significance of the claimed limitations is unclear to the examiner. The instant disclosure fails to provide reasoning or expected results for the claimed limitation ranges.

6. Claim 23 is rejected under 35 U.S.C. 103(a) as being unpatentable over Boyles in view of Hecht and in view of US 2,768,710 to Butler.

Boyles as modified by Hecht fails to teach a mechanical actuation device in combination with the application device. Butler teaches an application device, such as a fluid pressure device, working in combination with a mechanical actuation device. The combination provides a backup system to the primary system as taught by Butler, column 1 lines 19-24. It would have been obvious to one of ordinary skill in the art to have provided the brake device of Boyles as modified by Hecht with a mechanical actuation device in combination with the application device as taught by Butler, thus providing an alternate means by which to activate the brake system as necessary. The system of Butler utilizes balanced levers.

Allowable Subject Matter

7. Claim 18 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Response to Arguments

8. Applicant's arguments filed June 3, 2003 have been fully considered but they are not persuasive. Boyles clearly teaches in column 4 lines 25-35 that the brake assembly is equipped with four brake shoe sections or assemblies 46, 46', 47 and 47'. Furthermore, Boyles clearly teaches that each arcuate brake section is actuated by two pistons 45, see column 3 lines 1-3. In addition figure 1 clearly illustrates two piston actuation devices per brake shoe. The prior art of Hecht is merely relied upon as teaching the concept of using a metal/ceramic composite material when manufacturing a brake disc. Hecht clearly teaches in column 12 lines 1-18 a plurality of structural compositions, including ceramic and silicone carbide. This composition is disclosed on page 4 in the instant specification as being one possible metal/ceramic composition. Hecht is not relied upon as teaching two or more pistons per brake shoe section.

Conclusion

9. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period

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will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.


10. Any inquiries concerning this communication or earlier communications from the examiner should be directed to Thomas Williams whose telephone number is (703) 305-1346. The examiner can normally be reached on Monday-Thursday from 6:30 AM to 4:00 PM. The examiner can also be reached on alternate Fridays.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jack Lavinder, can be reached at (703) 308-3421. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9326.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-1113.

TJW
TJW

August 21, 2003


JACK LAVINDER
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 3600